

## **PRELIMINARY DATA SHEET**

# SKY85803: Dual-Band 802.11a/b/g/n/ac WLAN Front-End Module

## **Applications**

- 802.11b DSSS WLAN
- 802.11a/g OFDM WLAN
- 802.11n/ac WLAN
- Access points, PCMCIA, PC cards

## **Features**

- $\bullet$  All RF ports matched to 50  $\Omega$
- Integrated 2.4 GHz PA, 5 GHz PA, transmit filter, transmit/receive switches, and diplexers
- Integrated power detector for each transmit chain
- Power:
  - +21 dBm, 802.11b, 11 Mbps, ACPR = +35 dBc
- +18 dBm @ 3.0% EVM, 802.11n, 64 QAM, 2G
- +16 dBm @ 3.0% EVM, 802.11n, 64 QAM, 5G
- +16 dBm @ 1.8% EVM, 802.11ac, 256 QAM, 2G
- +13 dBm @ 1.8% EVM, 802.11ac, 256 QAM, 5G
- Single supply voltage: 3.3 V ± 10%
- Small LGA (24-pin, 4 x 4 mm) package (MSL3, 250 °C per JEDEC J-STD-020)



Skyworks Pb-free products are compliant with all applicable legislation. For additional information, refer to *Skyworks Definition of Lead (Pb)-Free*, document number SQ04-0073.

## Description

The SKY85803 is a complete 802.11a/b/g/n/ac WLAN RF Front-End Module (FEM) that provides all the functionality of the Power Amplifiers (PAs), filtering, power detector, transmit/receive (T/R) switch, diplexers, and associated matching.

The device provides a complete 2.4 GHz and 5.0 GHz WLAN RF solution from the output of the transceiver to the antenna in an ultra-compact form factor. The SKY85803 delivers < 2% EVM at rated AC power, which meets the stringent linearity conditions of the 802.11ac standard.

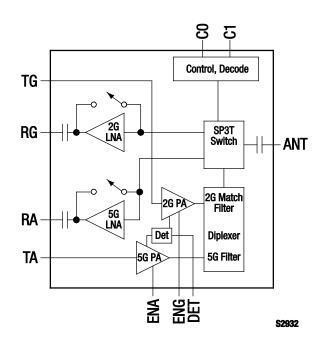


Figure 1. SKY85803 Block Diagram

Designed for ease of use, all RF ports are matched to 50  $\Omega$  to simplify PCB layout and the interface to the transceiver. The device also includes a transmitter power detector with 20 dB of dynamic range for each transmit chain. Each PA has a separate digital enable control for transmitter on/off control. The power ramp rise/fall time is  $< 0.4 \ \mu s.$ 

The SKY85803 also provides a notch filter from 3.260 to 3.267 GHz and 3.28 to 3.89 GHz before the input of each 2.4 GHz and 5.0 GHz PA, respectively.

The SKY85803 is manufactured in a compact, 4 x 4 mm, 24-pin Land Grid Array (LGA) package.

A functional block diagram is shown in Figure 1. The pin configuration and package are shown in Figure 2. Signal pin assignments and functional pin descriptions are provided in Table 1.

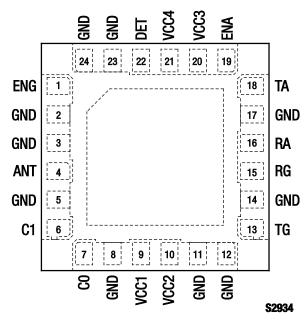


Figure 2. SKY85803 Pinout – 24-Pin LGA (Top View)

### Table 1. SKY85803 Signal Descriptions

| Pin # | Name | Description            | Pin # | Name | Description                       |
|-------|------|------------------------|-------|------|-----------------------------------|
| 1     | ENG  | 2.4 GHz PA enable      | 13    | TG   | 2.0 GHz transmit RF input         |
| 2     | GND  | Ground                 | 14    | GND  | Ground                            |
| 3     | GND  | Ground                 | 15    | RG   | 2.0 GHz receive RF output         |
| 4     | ANT  | Antenna                | 16    | RA   | 5.0 GHz receive RF output         |
| 5     | GND  | Ground                 | 17    | GND  | Ground                            |
| 6     | C1   | Switch control logic 1 | 18    | ТА   | 5.0 GHz transmit RF input         |
| 7     | CO   | Switch control logic 0 | 19    | ENA  | 5.0 GHz PA enable                 |
| 8     | GND  | Ground                 | 20    | VCC3 | Supply voltage                    |
| 9     | VCC1 | Supply voltage         | 21    | VCC4 | Supply voltage                    |
| 10    | VCC2 | Supply voltage         | 22    | DET  | 2.0/5.0 GHz power detector output |
| 11    | GND  | Ground                 | 23    | GND  | Ground                            |
| 12    | GND  | Ground                 | 24    | GND  | Ground                            |

| Parameter   | Symbol | Minimum | Maximum | Units |
|---|--------|---------|---------|-------|
| Supply voltage  | Vcc    | -0.3    | +3.6    | V     |
| PA enable voltage (pins ENA and ENG)  |        | -0.3    | +3.6    | V     |
| Maximum input power to TA and TG pins with ANT terminated in 6:1 load or better | Pin    |         | +12     | dBm   |
| Operating temperature   | Та     | -40     | +85     | °C    |
| Storage temperature   | Тѕтс   | -40     | +150    | °C    |
| Switch logic control  | C0, C1 | 0       | 3.6     | V     |
| LNA power (receive mode)  | Prx    |         | -3      | dBm   |

#### Table 2. SKY85803 Absolute Maximum Ratings

Note: Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.

*CAUTION*: Although this device is designed to be as robust as possible, Electrostatic Discharge (ESD) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions should be used at all times. The SKY85803 ESD threshold level is 1 kV (ANT pin zap to ground) and 250 V (all other pins).

#### Table 3. SKY85803 Recommended Operating Conditions

| Parameter             | Symbol | Minimum | Typical | Maximum | Units |
|-----------------------|--------|---------|---------|---------|-------|
| Supply voltage        | Vcc    | 3.0     | 3.3     | 3.6     | V     |
| Operating temperature | Та     | -40     | +25     | +85     | ٥°    |

## **Electrical and Mechanical Specifications**

The absolute maximum ratings of the SKY85803 are provided in Table 2. The recommended operating conditions are specified in Table 3 and electrical specifications are provided in Tables 4 through 12.

Typical performance characteristics of the SKY85803 are illustrated in Figures 3 and 4.

| Parameter                                  | Symbol   | Test Condition  | Min | Typical | Max | Units |
|--|----------|---|-----|---------|-----|-------|
| Total 802.11a transmit supply current      | Icq_a    | No RF   |     | 165     |     | mA    |
|  | ICC_A    | Pout = $+16 \text{ dBm}$ ,<br>54 Mbps, OFDM signal,               |     |         |     |       |
|  |          | 64 QAM  |     | 220     | 250 | mA    |
| Total 802.11g transmit supply current      | lca_g    | No RF   |     | 135     |     | mA    |
|  | lcc_g    | Pout = +18 dBm,<br>54 Mbps, OFDM signal,                          |     |         |     |       |
|  |          | 64 QAM  |     | 185     | 200 | mA    |
| Total 802.11b transmit supply current      | Ісс_в    | $P_{OUT} = +21 \text{ dBm},$<br>11 Mbps, CCK signal,<br>BT = 0.45 |     | 205     | 220 | mA    |
| Total 802.11ac transmit supply current, 2G | lcc_ac2g | Pout = +16 dBm,<br>256 QAM, MCS9, 40 MHz                          |     | 155     | 165 | mA    |
| Total 802.11ac transmit supply current, 5G | ICC_AC5G | Pout = +13 dBm,<br>256 QAM, MCS9, 80 MHz                          |     | 190     | 210 | mA    |
| Total receive supply current, 2G           | Icc_rx2  | ENG = ENA = 0 V, LNA on,<br>switch condition 1                    |     |         | 12  | mA    |
| Total receive supply current, 5G           | Icc_rx5  | ENG = ENA = 0 V, LNA on,<br>switch condition 4                    |     |         | 12  | mA    |
| Total supply current                       | ICC_OFF  | No RF, ENG = ENA = 0 V,<br>switch condition 3 or 6                |     | 65      | 200 | μA    |

Table 4. SKY85803 Electrical Specifications: DC Characteristics (Note 1) (Vcc = 3.3 V, Ta = +25 °C, All Unused Ports Terminated with 50  $\Omega$ , Unless Otherwise Noted)

Note 1: Performance is guaranteed only under the conditions listed in this Table.

# Table 5. SKY85803 Electrical Specifications: Logic Characteristics (Note 1) (Vcc = 3.3 V, Ta = +25 °C, All Unused Ports Terminated with 50 $\Omega$ , Unless Otherwise Noted)

| Parameter   | Symbol | Test Condition | Min | Typical | Мах | Units |
|---|--------|----------------|-----|---------|-----|-------|
| Logic high voltage for ENG and ENA<br>(module on) | Venh   |                | 1.8 |         | Vcc | V     |
| Logic low voltage for ENG and ENA (module off)    | VENL   |                | 0   |         | 0.5 | V     |
| Input current logic high voltage<br>(ENG and ENA) | lenh   |                |     | 350     | 400 | μА    |
| Input current logic low voltage<br>(ENG and ENA)  | IENL   |                |     | 0.2     |     | μΑ    |

Note 1: Performance is guaranteed only under the conditions listed in this Table.

| Parameter  | Symbol   | Test Condition                     | Min | Typical | Max       | Units    |
|--|----------|------------------------------------|-----|---------|-----------|----------|
| Control voltage (on state)                         | Vctl_on  |                                    | 3.0 |         | 3.6       | ٧        |
| Control voltage (off state)                        | VCTL_OFF |                                    | 0   |         | 0.2       | V        |
| Low loss switch control voltage                    | SWON     | High state = Vctl_on -<br>Vctl_off | 2.8 |         | Vcc       | V        |
| High loss switch control voltage                   | SWOFF    | Low state = Vctl_off -<br>Vctl_off | 0   |         | 0.3       | V        |
| Switch control bias current<br>RF applied<br>No RF | ICTL_ON  | CO and C1 pins driven high         |     |         | 100<br>30 | μΑ<br>μΑ |
| Control input capacitance                          | Ссть     |                                    |     |         | 100       | pF       |

Table 6. SKY85803 Electrical Specifications: Switch Characteristics (Note 1) (Vcc = Ven = 3.3 V, TA = +25 °C, All Unused Ports Terminated with 50  $\Omega$ , Unless Otherwise Noted)

Note 1: Performance is guaranteed only under the conditions listed in this Table.

| Table 7. SKY85803 Electrical Specifications: 2.4 GHz Transmit Characteristics (1 of 2) (Note 1)                              |  |
|--|--|
| (Vcc = ENG = C0 = 3.3 V, ENA = C1 = 0 V, TA = +25 °C, All Unused Ports Terminated with 50 $\Omega$ , Unless Otherwise Noted) |  |

| Parameter                             | Symbol        | Test Condition   | Min   | Typical | Мах  | Units |
|---------------------------------------|---------------|--|-------|---------|------|-------|
| Frequency range                       | f             |  | 2400  |         | 2500 | MHz   |
| Output power, 802.11g                 | Ρουτ_802.116  | 54 Mbps OFDM signal, 64<br>QAM, DEVM = 3%, input<br>signal EVM < 1%,<br>802.11g mask compliant                                 |       | +18     |      | dBm   |
| Output power, 802.11n                 | Pout_802.11N  | OFDM signal, MCS7,<br>HT40, DEVM = $3\%$ ,<br>802.11n mask compliant,<br>$\pm 11$ MHz offset, RBW =<br>100 kHz, VBW = $30$ kHz |       | +18     |      | dBm   |
|                                       |               | DEVM = 2%  |       | +17     |      | dBm   |
| Output power, 802.11ac                | Pout_802.11ac | 40 MHz, 256 QAM, MCS9,<br>DEVM = 1.8%, 802.11ac<br>mask compliant  |       | +16     |      | dBm   |
|                                       |               | DEVM = $1.2\%$   |       | +10     |      | dBm   |
| Output power, 802.11b                 | Роит_802.11в  | 11 Mbps CCK signal,<br>BT = 0.45,<br>ACPR (±11 MHz offset)<br>< -35, ACPR (±22 MHz<br>offset) < -56                            |       | +21     | +22  | dBm   |
| 1 dB compression point                | P1dB          |  | +24.0 | +24.5   |      | dBm   |
| Small signal gain                     | S21           |  | 25    |         | 30   | dB    |
| Small signal gain variation over band | ∆ S21         |  |       | 1       | 2    | dB    |
| Small signal gain @ 1/2 VCO frequency | S21 _1.6      | 1640 to 1942 MHz   |       | 12      | 20   | dB    |
| Small signal gain @ VCO frequency     | S21 _3.2      | 3216 to 3312 MHz   |       |         | 0    | dB    |

| Parameter                                     | Symbol   | Test Condition   | Min       | Typical                             | Max       | Units   |
|---|----------|--|-----------|-------------------------------------|-----------|---------|
| 2 <sup>nd</sup> and 3 <sup>rd</sup> harmonics | 2fo, 3fo | $\begin{array}{l} Pout \leq +21 \ dBm, \ 1 \ Mbps, \\ CCK \end{array}$   |           |                                     | -40       | dBm/MHz |
|   |          | Pout $\leq$ +18 dBm, 802.11g/n, all data rates   |           |                                     | -50       | dBm/MHz |
| Delay and rise/fall time                      | tdr, tdf | 50% of VeN edge and<br>90/10% of final output<br>power level   |           | 0.2                                 | 0.4       | μs      |
| Input return loss                             | S11      |  | 9         | 10                                  |           | dB      |
| Stability                                     | STAB     | $\begin{array}{l} \text{CW, Pout}=+21 \text{ dBm,}\\ 0.1 \text{ to } 21 \text{ GHz,}\\ \text{load VSWR}=6:1 \end{array}$ | All non-h | narmonically relate<br><-42 dBm/MHz | d outputs | -       |
| Ruggedness                                    | Ru       | TG = +12  dBm, ANT load varies over 6:1 VSWR   | No        | ) irreversible dama                 | age       | -       |

Table 7. SKY85803 Electrical Specifications: 2.4 GHz Transmit Characteristics (2 of 2) (Note 1) (Vcc = ENG = C0 = 3.3 V, ENA = C1 = 0 V, TA = +25 °C, All Unused Ports Terminated with 50  $\Omega$ , Unless Otherwise Noted)

Note 1: Performance is guaranteed only under the conditions listed in this Table.

 Table 8. SKY85803 Electrical Specifications: 2.4 GHz Receive Characteristics (Note 1)

 (Vcc = 3.3 V, Switch Condition 1, TA = +25 °C, All Unused Ports Terminated with 50  $\Omega$ , Unless Otherwise Noted)

| Parameter   | Symbol | Test Condition  | Min       | Typical | Max  | Units |
|---|--------|---|-----------|---------|------|-------|
| Frequency range   | f      |   | 2400      |         | 2500 | MHz   |
| Small signal gain, LNA enabled                          | S21    | 2400 to 2485 MHz  | 10        | 14      | 16   | dB    |
| Small signal gain, bypass mode                          | S21    | LNA bypassed, switch<br>condition 3                                     | -12       |         | -10  | dB    |
| Small signal gain, high band gain<br>@ 5150 to 5850 MHz | S21    |   |           | -10     |      | dB    |
| Small signal gain variation                             | ∆lS21I | 2400 to 2485 MHz, over<br>any 40 MHz band                               |           | 0.25    | 0.50 | dB    |
| Noise Figure  | NF     | De-embedded to device   |           | 2.5     | 2.8  | dB    |
| Input return loss                                       | S11    |   | 5         | 10      |      | dB    |
| 1 dB input compression point                            | IP1dB  | LNA enabled   |           | -7      |      | dBm   |
|   |        | LNA bypassed, switch<br>condition 3                                     |           | +8      |      | dBm   |
| Loopback isolation (ANT to RG pins)                     | LB     | Switch condition 2,<br>Pout = Psat                                      | Psat + 10 | 40      |      | dB    |
| Enable time   | ten    | 10% to 90% of receive RF<br>power from time that C0<br>signal is at 50% |           |         | 0.2  | μs    |

| Parameter                                       | Symbol        | Test Condition  | Min       | Typical                             | Max              | Units          |
|---|---------------|---|-----------|-------------------------------------|------------------|----------------|
| Frequency range                                 | f             |   | 4900      |                                     | 5900             | MHz            |
| Output power, 802.11n                           | Роит_802.11N  | OFDM signal, MCS7,<br>HT40, DEVM = 3%,<br>802.11n mask compliant,<br>±11 MHz offset, RBW =<br>100 kHz, VBW = 30 kHz |           | +16                                 |                  | dBm            |
|   |               | DEVM = 2%   |           | +15                                 |                  | dBm            |
| Output power, 802.11ac                          | Pout_802.11ac | 80 MHz, 256 QAM, MCS9,<br>DEVM = 1.8%, input<br>signal EVM < 0.6%,<br>802.11ac mask compliant                       |           | +13                                 |                  | dBm            |
|   |               | DEVM = 1.2%   |           | +12                                 |                  | dBm            |
| 1 dB compression point                          | P1dB          |   | +21.0     | +22.5                               |                  | dBm            |
| Small signal gain                               | S21           | In band<br>@ 1.9 GHz<br>@ 3.9 GHz   | +23       |                                     | +30<br>-20<br>+4 | dB<br>dB<br>dB |
| Small signal gain variation over 80 MHz channel | ∆lS21I        |   | -1        |                                     | +1               | dB             |
| Small signal gain variation over sub-bands      | ∆lS21I        | 4.90 to 5.18 GHz,<br>5.18 to 5.50 GHz,<br>5.50 to 5.90 GHz  |           | 2                                   | 3                | dB             |
| Isolation                                       | S12           | Switch state 5,<br>4.9 to 5.9 GHz   |           |                                     | -45              | dB             |
| 2 <sup>nd</sup> and 3 <sup>rd</sup> harmonics   | 2fo, 3fo      | @ +16 dBm, 54 Mbps,<br>802.11a  |           |                                     | -50              | dBm/MHz        |
| Delay and rise/fall time                        | tor, tof      | 50% of Ven edge and<br>90/10% of final output<br>power level  |           | 0.2                                 | 0.4              | μs             |
| Input return loss                               | S11           |   |           | 10                                  |                  | dB             |
| Output return loss                              | S22           |   |           | 10                                  |                  | dB             |
| Stability                                       | STAB          | 64 QAM, Pout = +16 dBm,<br>0.1 to 21 GHz,<br>load VSWR = 6:1  | All non-h | narmonically relate<br><-42 dBm/MHz | d outputs        | -              |
| Ruggedness                                      | Ru            | TA = +12 dBm, ANT load<br>varies over 6:1 VSWR  | No        | o irreversible dama                 | ige              | -              |

Table 9. SKY85803 Electrical Specifications: 5.0 GHz Transmit Characteristics (Note 1) (Vcc = ENA = C0 = 3.3 V, ENG = C1 = 0 V, TA = +25 °C, All Unused Ports Terminated with 50  $\Omega$ , Unless Otherwise Noted)

| Parameter  | Symbol | Test Condition  | Min  | Typical | Max  | Units |
|--|--------|---|------|---------|------|-------|
| Frequency range  | f      |   | 4900 |         | 5850 | MHz   |
| Small signal gain                                      | S21    | 4900 to 5850 MHz  | 10   | 12      | 14   | dB    |
| Small signal gain, bypass mode                         | S21    | LNA bypassed, switch condition 6  | -14  |         | -10  | dB    |
| Small signal gain, low band gain<br>@ 2400 to 2500 MHz | S21    |   |      | -10     |      | dB    |
| Small signal gain variation                            | ∆lS21I | 4900 to 5850 MHz, over<br>any 80 MHz band                               | -0.5 |         | +0.5 | dB    |
| Noise Figure   | NF     | De-embedded to device   |      | 2.8     | 3.0  | dB    |
| Input return loss                                      | IS211  |   | 8    | 10      |      | dB    |
| Output return loss                                     | IS22I  |   | 6    | 10      |      | dB    |
| 1 dB input compression point                           | IP1dB  | LNA enabled   | -6   |         |      | dBm   |
|  |        | LNA bypassed, switch condition 6  | +6   |         |      | dBm   |
| Loopback isolation (TA to RA pins)                     | LB     | Switch condition 5,<br>Pout = Psat                                      |      | -40     |      | dB    |
| Enable time  | ten    | 10% to 90% of receive RF<br>power from time that CO<br>signal is at 50% |      |         | 0.2  | μs    |

Table 10. SKY85803 Electrical Specifications: 5.0 GHz Receive Characteristics (Note 1) (Vcc = 3.3 V, Switch Condition 4, TA = +25 °C, All Unused Ports Terminated with 50  $\Omega$ , Unless Otherwise Noted)

# Table 11. SKY85803 Electrical Specifications: 2.0 GHz Power Detector Characteristics (Note 1) (Vcc = 3.3 V, Switch Condition 2, TA = +25 °C, All Unused Ports Terminated with 50 $\Omega$ , Unless Otherwise Noted)

| Parameter   | Symbol   | Test Condition                        | Min  | Typical | Max  | Units |
|---|----------|---------------------------------------|------|---------|------|-------|
| Frequency range                                       | f        |                                       | 2400 |         | 2500 | MHz   |
| Power detector range, peak power                      | PDR      | Measured at ANT pin                   | 0    |         | +22  | dBm   |
| DC output impedance                                   | PDZout   |                                       |      | 2.3     |      | kΩ    |
| Output voltage @ Pout = +21 dBm                       | PDVp21   | Measured into 26.5 $k\Omega$          |      | 0.80    |      | ٧     |
| Output voltage @ Pout = +18 dBm                       | PDVp18   | Measured into 26.5 k $\Omega$         |      | 0.60    |      | ٧     |
| Output voltage, no RF output power                    | PDVPNORF | Measured into 26.5 k $\Omega$         |      | 0.20    |      | ٧     |
| Power detector low-pass filter –3 dB corner frequency | LPF-3DB  | Measured into 26.5 $k\Omega$          | 70   |         |      | MHz   |
| Power detector accuracy                               | PDETACC  | Measured into 3:1 load at<br>ANT port | -1.5 |         | +1.5 | dB    |

| Parameter   | Symbol   | Test Condition                        | Min  | Typical | Мах  | Units |
|---|----------|---------------------------------------|------|---------|------|-------|
| Frequency range                                       | f        |                                       | 4900 |         | 5900 | MHz   |
| Power detector range, peak power                      | PDR      | Measured at ANT pin                   | 0    |         | +21  | dBm   |
| DC output impedance                                   | PDZout   |                                       |      | 26.5    |      | kΩ    |
| Output voltage @ Pout = +18 dBm                       | PDVp18   | Measured into 26.5 k $\Omega$         |      | 0.70    |      | V     |
| Output voltage @ Pout = +16 dBm                       | PDVp21   | Measured into 26.5 k $\Omega$         |      | 0.60    |      | ٧     |
| Output voltage, no RF output power                    | PDVPNORF | Measured into 26.5 k $\Omega$         |      | 0.20    |      | V     |
| Power detector low-pass filter –3 dB corner frequency | LPF-3db  | Measured into 26.5 k $\Omega$         | 70   |         |      | MHz   |
| Power detector accuracy                               | PDETACC  | Measured into 3:1 load at<br>ANT port | -2   |         | +2   | dB    |

Table 12. SKY85803 Electrical Specifications: 5.0 GHz Power Detector Characteristics (Note 1) (Vcc = 3.3 V, Switch Condition 5, TA = +25 °C, All Unused Ports Terminated with 50  $\Omega$ , Unless Otherwise Noted)

# **Typical Performance Characteristics**

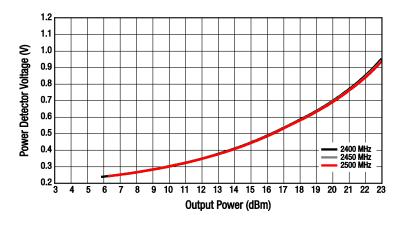


Figure 3. Power Detector vs Output Power Over Frequency @ 2.5 GHz

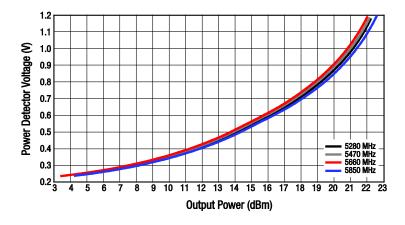


Figure 4. Power Detector vs Output Power Over Frequency @ 5.0 GHz

## **Evaluation Board Description**

The SKY85803 Evaluation Board is used to test the performance of the SKY85803 WLAN FEM. An Evaluation Board schematic diagram is provided in Figure 5. A photograph of the Evaluation Board is shown in Figure 6. Component values for the SKY85803 Evaluation Board are listed in Table 14.

### **Evaluation Board Setup Procedure**

Step 1: Connect system ground to pin 2 of connector J6.

Step 2: Apply 3.3 V to pin 1 of connector J6.

Step 3: Select a path according to the logic shown in Table 13.

## **Package Dimensions**

The PCB layout footprint for the SKY85803 is provided in Figure 7. Typical case markings are shown in Figure 8. Package dimensions for the 24-pin LGA are shown in Figure 9, and tape and reel dimensions are provided in Figure 10.

## **Package and Handling Information**

Since the device package is sensitive to moisture absorption, it is baked and vacuum packed before shipping. Instructions on the shipping container label regarding exposure to moisture after the container seal is broken must be followed. Otherwise, problems related to moisture absorption may occur when the part is subjected to high temperature during solder assembly.

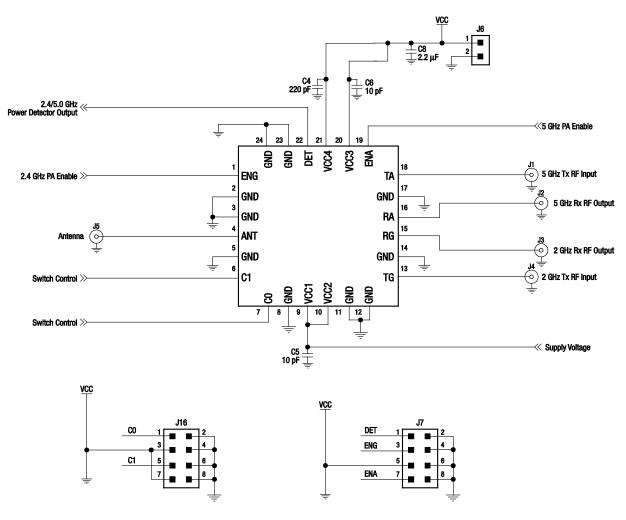
THE SKY85803 is rated to Moisture Sensitivity Level 3 (MSL3) at 250 °C. It can be used for lead or lead-free soldering. For additional information, refer to the Skyworks Application Note, *Solder Reflow Information*, document number 200164.

Care must be taken when attaching this product, whether it is done manually or in a production solder reflow environment. Production quantities of this product are shipped in a standard tape and reel format.

#### Table 13. SKY85803 Evaluation Board Switch Control Logic

|           | Logic                        |                              |                              |                              | State |           |           |  |
|-----------|------------------------------|------------------------------|------------------------------|------------------------------|-------|-----------|-----------|--|
| Condition | CO<br>(Pin 1, J16<br>Header) | C1<br>(Pin 5, J16<br>Header) | ENA<br>(Pin 7, J7<br>Header) | ENG<br>(Pin 3, J7<br>Header) | SP3T  | LNA       | Bypass    |  |
| 1         | 0                            | 1                            | 0                            | 0                            | RG    | RG enable | Open      |  |
| 2         | 0                            | 0                            | 0                            | 1                            | TG    | RG off    | RG bypass |  |
| 3         | 0                            | 0                            | 0                            | 0                            | RG    | RG off    | RG bypass |  |
| 4         | 1                            | 1                            | 0                            | 0                            | RA    | RA enable | Open      |  |
| 5         | 1                            | 0                            | 1                            | 0                            | TA    | RA off    | RA bypass |  |
| 6         | 1                            | 0                            | 0                            | 0                            | RA    | RA off    | RA bypass |  |

Note: "0" = 0 V. "1" = +3.3 V. Any state other than described in this Table places the switch into an undefined state. An undefined state will not damage the device.



Note: Some component labels may be different than the corresponding component symbol shown here. Component values, however, are accurate as of the date of this Data Sheet.

S2935

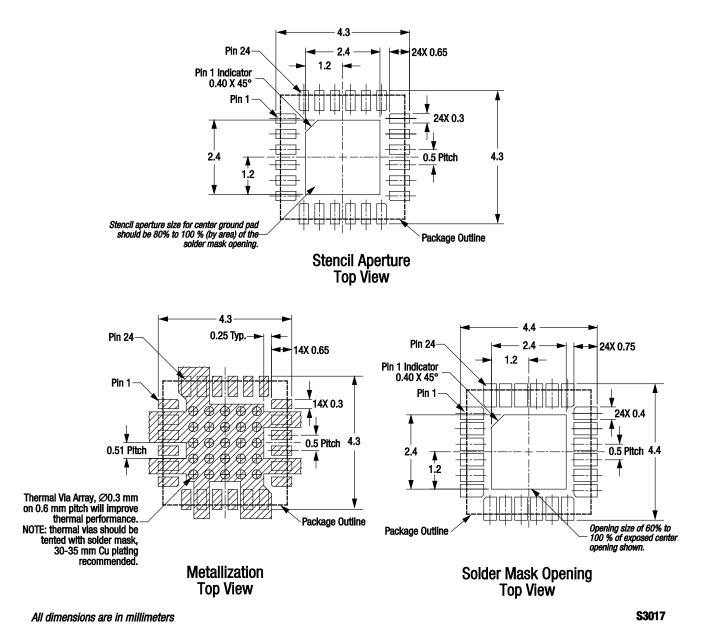
### Figure 5. SKY85803 Evaluation Board Schematic



Figure 6. SKY85803 Evaluation Board Photo

### Table 14. SKY85803 Evaluation Board Bill of Materials

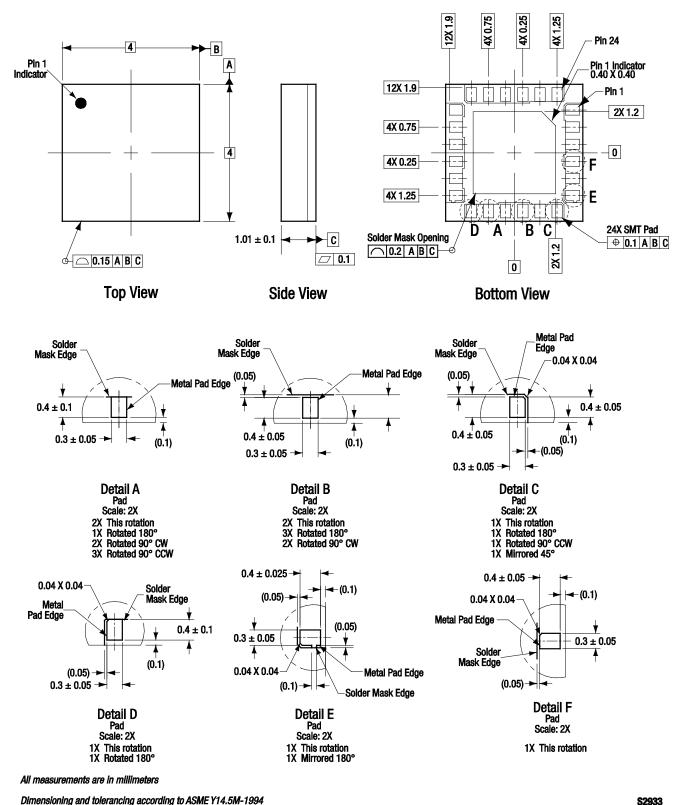
| Component | Size | Value  | Vendor | Part #             | Comments                         |
|-----------|------|--------|--------|--------------------|----------------------------------|
| C4        | 0402 | 220 pF | Murata | GRM1555C1H221JA01  | Multilayer ceramic               |
| C5, C6    | 0402 | 10 pF  | Murata | GRM1555C1H100JZ01  | Multilayer ceramic               |
| C8        | 0805 | 2.2 μF | Murata | GRM21BR71A225KA01L | Ceramic capacitor, 10 V, 10% X7R |





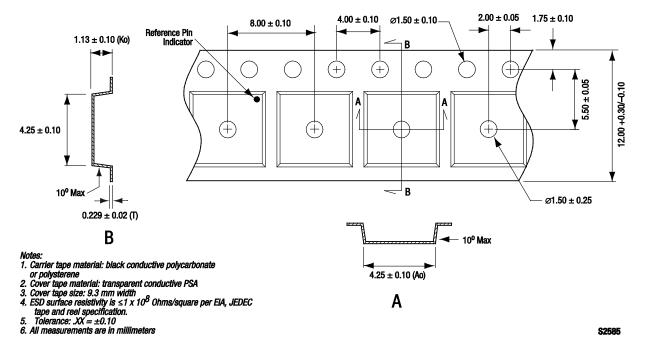
\*\*\* TBD \*\*\*

Figure 8. Typical Case Markings (Top View)



Dimensioning and tolerancing according to ASME Y14.5M-1994







### **Ordering Information**

| Model Name        | Manufacturing Part Number | <b>Evaluation Board Part Number</b> |  |
|-------------------|---------------------------|-------------------------------------|--|
| SKY85803 WLAN FEM | SKY85803                  | SKY85803-EVB                        |  |

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